



Product introduction

Welcome to use our PV dust monitor (Soiling Sensor). For better use of the instrument, we recommend you to read the product manual carefully before use.

Our company is always in the process of continuous exploration and research and development, and we reserve the right to improve the performance and design without prior notice.

Product introduction

Contaminants on solar module glass are one of the main factors affecting power generation in photovoltaic (PV) plants, reducing efficiency and cost-effectiveness. The use of blue light pollutant photoclosed loop measurement technology can be easily installed in new or existing PV arrays and integrated into the plant management system. The device is mounted on the frame of the PV panels and calculates the reduction of sunlight reaching the solar module by continuously measuring the proportion of pollutants on the glass.

By measuring the proportion of pollutants (SR), this translates into a loss of power generation in real time. This allows O&M personnel to know when contaminants have reached a critical point and it has become necessary to start the cleaning process. The product requires no maintenance and simply needs to be cleaned in the same way as the surrounding modules.

Technical parameters

Supply Voltage	DC 12V
Signal output	RS485
Communication	Standard MODBUS
Baud rate	9600 bps
Average power	1W
Pollution ratio	Dual sensor value 50 to
Pollution Measurement Accuracy	±1% (measuring range 90~100%)
Temperature	±3% (measuring range
Temperature	±5% (Measuring range

Connection method

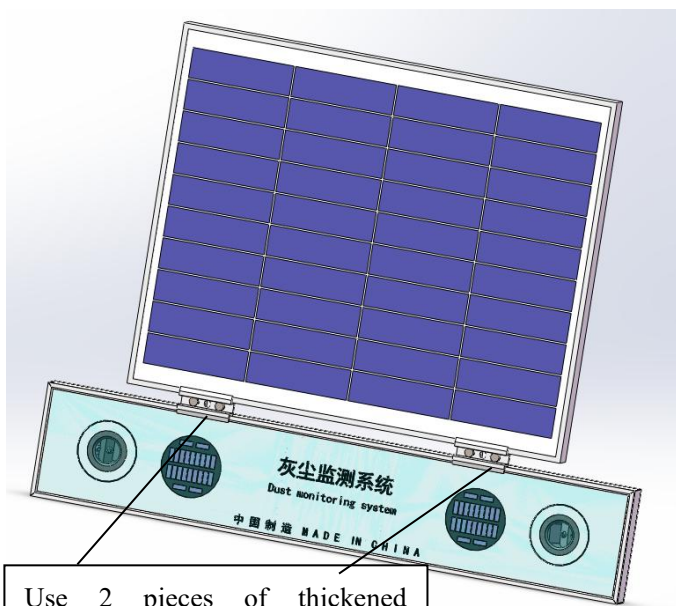
Wire Colour	Definition
Red	Power Input Positive
Black (Green)	Power Input Negative
Yellow	RS485+
Blue	RS485-

Note: The wiring label on the cable is final.

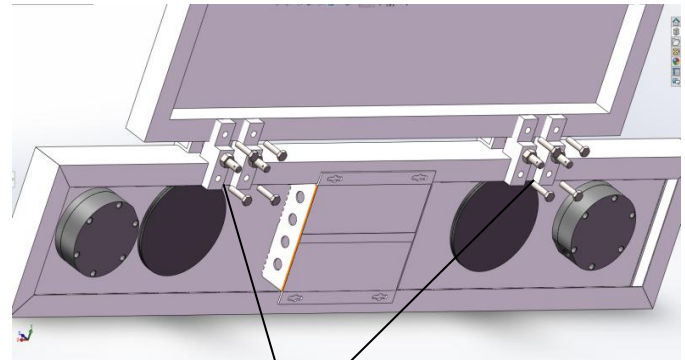
Dimensions



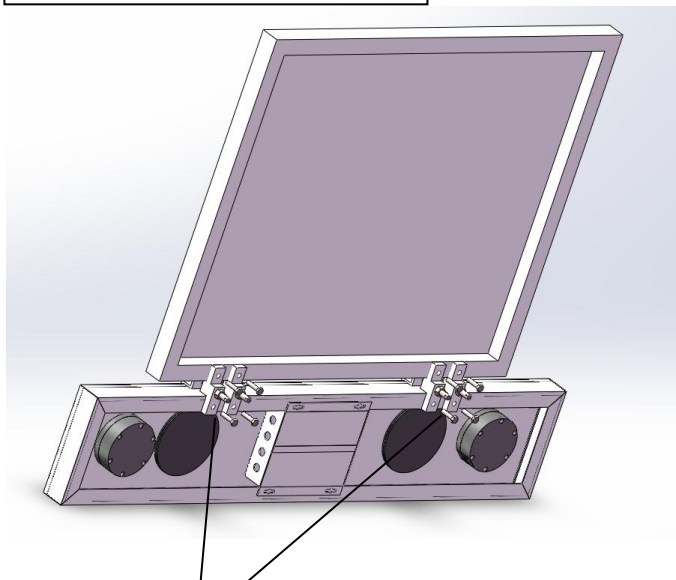
Installation diagram



Use 2 pieces of thickened medium pressure block
4pcs 304 hexagon socket head cap screws M8*60 , install them according to the direction shown



After the M8 nut is locked, use the hand drill with $\phi 6.2$ drill bit to drill holes in the dust and component bezel respectively, drilling a total of 8 holes, using 8 304 hexagon socket M6*25 screws, passing through the drilled holes, and locking the 8 M6 nuts to complete the installation.



Dust and PV panel fixings are 4 in total, locking 4 M8 nuts after passing through the M8*60 screws.

Usage and Precautions

1、 Installation of equipment, with a special fixture to install the dust monitoring system on the top or side of the battery board, so that the battery board and the dust monitoring system are on the same level.

2, connect the cable, dust monitoring system is installed, connect the RS485 communication line and DC12V power line, if the site only AC220V power supply, you can choose outdoor AC220V to DC12V power converter, AC220V AC power conversion to DC12V power.

3、 After the equipment is installed, choose a sunny weather and calibrate it between 12:00 and 14:00 noon. Firstly, wipe the sensor mirror clean, then press and hold the calibration button to keep 10 seconds, release the button calibration is complete.

4、Product cleaning, please clean the two sensor probes every time you do cleaning work on the battery component.

MODBUS Communication Protocol

Communication parameters: baud rate 9600bps, data bit 8 bits, no parity bit.

The interval between two communications is more than 1000ms.

[1] Write device address

Send: 00 10 Address CRC (5 bytes)

Return: 00 10 CRC (4 bytes)

Note:

1. The address of read/write address command must be 00.

2. Address is 1 byte, the range is 0-255.

Example:

Send: 00 10 01 BD C0

Return: 00 10 00 7C

[2] Read device address

Send: 00 20 CRC (4 bytes)

Return: 00 20 Address CRC (5 bytes)

Note: Address is 1 byte, the range is 0-255.

Example:

Send: 00 20 00 68

Return: 00 20 01 A9 C0

[3] Read real-time data:

The host sends the message as follows:

slave address	Function code	Register address (HL)	No. of registers	CRC16
XX	03	00 00	00 0X	low front and high back

Slave replies below:

slave address	Function code	Number of data segment bytes	Data segment data	CRC16
XX	03	XX	XX XX	low front and high back

If the device address is 0x01, the

Send: 01 03 00 00 00 03 05 CB

Return: 01 03 06 03 C5 03 C8 00 EB 2C A2

The real time data read is

Cleanliness 1: 0x03C5 = 965 => Cleanliness = 96.5 per cent

Cleanliness 2: 0x03C8 = 968 => Cleanliness = 96.8%

Backplane temperature 00 EB => 23.5°C

P.S. Calculation of CRC16 check digit

1)Preset 1 16-bit register to hex FFFF (i.e. all 1's); call this register the CRC register;

2) Isolate the first 8-bit binary data (i.e., the first byte of the communication information frame) with the lower 8 bits of the 16-bit CRC register, and place the result in the CRC register;

3)Shift the contents of the CRC register right one bit (towards the lower bit) to fill the highest bit with 0, and check the shifted out bit after the right shift;

4) If the shifted out bit is 0: repeat step 3 (shift right one bit again);

If the shifted out bit is 1: the CRC register is iso-or with the polynomial A001 (1010 0000 0000 0001);

5) Repeat steps 3 and 4 until it is shifted right 8 times so that the entire 8-bit data is all processed;

6) repeating steps 2 to 5 for the next byte of the communication information frame;

7) exchanging the high and low bytes of the 16-bit CRC register obtained after all bytes of this communication information frame have been calculated according to the above steps;

8) The content of the CRC register obtained at last is the

CRC16 code. (Note that the CRC code obtained is the order of low before high)

After Sales & Service

- If there is any problem with the equipment, you can contact our staff to analyse and answer the problem; if the equipment needs to be returned, please pack the instrument and mail it to us with a detailed fault description of the instrument.
- If the user disassembles or damages the equipment by himself, he will no longer enjoy our quality guarantee.
- The warranty period is one year from the date of purchase, if the product cannot be used normally during the warranty period, please contact us immediately.

Contact us

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